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ABSTRACT

Researchers attempted to predict the defeat of school board incumbents, using variables which had already been shown to account for incumbent defeat in statistical analyses performed after board elections in many different states. A global model was constructed based on 20 social, economic, and political variables as well as on school districts' assessed valuations, average daily membership, tax rates, number of challengers, and number of incumbents retiring or running. Preliminary tests on a stratified random sample of 95 Ohio school districts showed that the global model successfully accounted for past incumbent defeats in 1975. The same model, however, failed to predict 1977 incumbent defeats in the same districts. These results suggest that such global models are not useful in predicting incumbent defeat in particular district elections. Instead, more specific models must be used for individual districts. (Author/RW)

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PREDICTING SCHOOL BOARD MEMBER INCUMBENT DEFEAT

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Dallas School District

Presented at AERA, 1981

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Introduction

Many of us who remember the "good old days" watched the televised reporting of the 1980 presidential elections with disappointment, aggravated by nostalgia. Remember when Dewey beat Truman? Oh, that's right; it turned out the other way! Newspapers had already hit the streets with headlines, "Dewey defeats Truman." Through the night loyal party workers and tens of thousands of those of us who, as Skeffington noted, are loyal followers of our "greatest national spectator sport," sat glued to our radios listening to Kaltenborn report the election results as they came in and comment -- "But the upstate vote is not yet in!" Early in the morning we wearily gave up and fell into bed -- still not knowing who the next president was to be. Oh, how sweet it was!

Now, before we settle into our chairs, after but one state has reported as much as 30% of the vote, before the polls in the Western states have closed, before the presumably important electoral states of New York, New Jersey, Pennsylvania, Illinois and Michigan can be predicted by the computers, one network has already let the cat out of the bag and called the election. Before the polls close in California and Hawaii, Carter has conceded!

It's like buying a race horse, training it, racing it in "warm up races," entering it in the Derby, grooming it, helping your jockey into the saddle, and watching with anticipation the parade to the post. Then just as the bell goes off and the announcer shouts, "They're off" -- instead he announces the winner! Predicting elections, who needs it??

But there are some compelling reasons for being interested in predicting elections. Elections are the fundamental component of American representative government. To be able to account for voter behavior and to be able to predict elections would appear to contribute to an understanding of that process and thus be an important step in making the process stronger. Why do some voters not vote? Why do others tend to vote party tickets? What do voters attend to in deciding? In other words, what influences his/her vote?

The process of local school governance and particularly the election of local school board members has been identified by Lutz and Iannaccone (1978) as the fundamental grass roots aspects of American Democracy. The understanding and explanation of the election of school board members -- more correctly the defeating of one or more of the incumbent members of a local school board, has been the focus of this line of research called, "The Dissatisfaction Theory."

Theoretical Prospective

Briefly this prospective holds that the essential element of democracy is freedom to participate in the governmental process, and through free elections, decide who will hold office. This is counter to other theories based on the presumption that either universal participation in the process or congruence of public demands and governmental policy is the core element of democracy.

It is the freedom to participate (or fail to participate) in the election that is the core ingredient in the American democratic process. The dissatisfaction theory holds that when people are dissatisfied enough, they will be moved to political activity. Then voter participation increases in local school elections, more people file for school board seats and campaign for office. As this trend continues, incumbent school board members are defeated, resulting often in superintendent turnover, outside succession and changed education policy in the local district. This is American democracy at its zenith!

Almost twenty years of research has gone into the development and verification of this theory. These include studies in every section of the nation from east to west, including Lutz (1962), Kirkendall (1966), Iannaccone and Lutz (1968), LeDoux (1971), Moen (1972), Garberina (1975), Thorsted (1974), Mitchell and Thorsted (1976) and Lutz and Iannaccone (1978). From this line of research not only did the theoretical model emerge, but a series of social, economic and political indicators were identified which have consistently accounted for incumbent defeat in school board elections as opposed to elections without incumbent defeat.

According to best practice in conducting research, we first noted the event and consistencies surrounding it, we then statistically verified the conditions consistently accounting for the presence or absence of the event, and finally we predicted the event or in some fashion predicted, "if A exists then B will occur." The next logical step in this line of research appeared to be an effort to predict incumbent school board defeat based on the variables identified in previous studies as capable of accounting for the event after it had occurred. This research was the first effort in such a prediction. The following hypotheses were generated:

HO_1: Those variables previously and consistently found useful in accounting for incumbent defeat in local school board elections would again account for a significant amount of the variance between incumbent defeat and no incumbent defeat in school board elections.

HO_2: A mathematical model could be built on historic demographic data related to the variables previously demonstrated as useful in accounting for incumbent defeat in local school elections that could predict future incumbent defeat in the same districts.

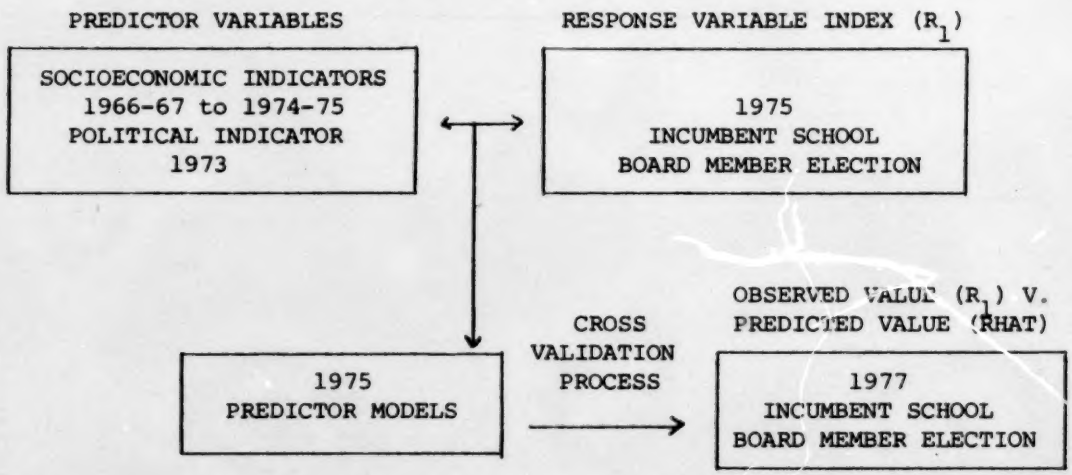
Operational Framework for the Study

It was the intent of this study to investigate whether or not a predictor model possessed universality. Would a set of indicators of community conditions be able to predict an election outcome on a randomly selected set of school districts?

The operational phase of the study included the generation of the 1975 predictor models and the cross-validation process on the 1977 school board election. This process used uncontrolled division since the models were statistically tested on an independent set of election data. Figure 1 offers a graphic description of the operational framework.

Figure 1

The Operational Framework



The Sample

The school districts of Ohio were selected for several reasons. We had reasonable geographic access to Ohio from The Pennsylvania State University, the home site of the researchers at the time the research was conducted. Ohio had received national attention due to a taxpayer revolt in school tax elections. If our theory worked in Ohio it would have impact. At the time the data were collected, 1977-78, Ohio's local school districts were governed by 616 local boards elected by local elections.

The Districts' Subset Classifications

A set of 95 school districts was selected on a stratified-random basis from the 616 school districts, excluding the six major cities in Ohio. This sample represented 15% of Ohio's public schools. Data were collected on the social, economic and political indicators previously demonstrated as useful, for the ten years prior to the 1977 school board elections. These indicators were derived from the following characteristics of a school district:[1] (a) Assessed valuation, (b) A.D.M. (c) Tax rate, (d) School board election dimensions. Based on empirical evidence that the general trend of the social, economic and political indicators, either up or down, affected the specific variables and their influence, districts were grouped as upward or downward trend districts.

In the generation of the 1975 predictor models, the subsetting of the data included the time period, 1969-70 to 1973-74. This four-year-period was selected because it gave a more recent picture of the community's trend just prior to the 1975 election, the election directly prior to the 1977 elections to be predicted. Another reason is that for an incumbent candidate contemplat-

[1]The reader is referred to Hunt (1980; pp. 106-112) for the specific social, economic and political indicators used in this study.

ing the 1975 election, the year 1969-70 is one year prior to when he was elected in 1971. Thus, the four-year period would serve to show both the incumbent's activity as well as the community's socio-economic and political development.

The following criteria were used to subset the data. The number of increases for each of the four variables: (1) Assessed valuation, (2) Assessed valuation/average daily membership, (3) Average daily membership, and (4) Tax rate was noted for the four-year period, 1969-70 to 1973-74. The number of increases could range from 0 to 4. For each variable, if:

the number of increases = 3 or 4, it is scored as 1;

the number of increases = 2, it is scored as .5;

the number of increases = 0 or 1, it is scored as 0.

The total number of scores for the four variables becomes the criteria value or CRIT. The criteria value can range from 0 to 4 in increments of .5.

The subsetting of the data is determined as follows:

If CRIT $\geq$ 2.5, the school district is placed into an up category (1).

If CRIT $\leq$ 2.0, the school district is placed into a down category (0).

This process placed 58 school districts in the up category and 37 districts in the down category.

This definition of the up and down categories based upon an analysis of the initial stepwise regression on combined, up and down categories resulted in some inconsistencies and prompted the division of the data into three groups. The subsetting was based upon the following criteria:

If CRIT $\leq$ 2.0, the school district is placed into a down category (0).

If CRIT = 2.5, the school district is placed into a mid category (1).

If CRIT $\geq$ 3.0, the school district is placed into an up category (2).

The classification of each of the sample school districts into a downward (0), moderate (1), or upward (2) trend category was as follows: 37 school districts were placed into the downward category, 31 into the moderate category and 27 school districts entered the upward category. It was from these data subsets that the first three predictor models were generated.

The Quantifying of the Dependent Variable-Incumbent Defeat

Previous studies examining incumbent defeat in school board elections categorized incumbent defeat as simply yes (one or more incumbents defeated) or no (no incumbents defeated). While the rules were slightly more complex, the result was to dichotomize the dependent variable. LeDoux and Burlingame (1973) noted the flaw in this reasoning and made some modifications.

In support of LeDoux and Burlingame's observations, Mitchell and Thorsted (1976) suggested that the number of challengers and the rate of incumbent retirement may have a significant impact on the incumbent defeat process. They proved through the testing of the relationship between the number of challengers and the defeat of an incumbent, and the development of the Challenger Index that the rate of incumbent retirement is associated with the incumbent defeat process.

Given these developments, this study expanded the previously dichotomous dependent variable to include the number of challengers and the rate of incumbent retirement. The inclusion of these dimensions strengthened the model's predictability factor and the validation of the dissatisfaction theory. The following election dimensions were used to calculate a response variable index (R_1) with an extended scale of possible scores:

--the number of positions

--the number of challengers

--the number of incumbents running

--the number of incumbents not seeking reelection

--the number of votes cast for each candidate

--the number of incumbents winning the election

The response variable index was presumed to be some measure of citizen dissatisfaction and/or political change. Incumbent school board member defeat operationalized this measure. A straight-forward calculation for this measure would be:

$$\frac{\text{Incumbents Winning}}{\text{Number of Positions}}$$

However, the rate of incumbent retirement was taken into consideration. Thorsted and Mitchell were able to show how the Challenger Index links the rate of incumbent retirement with the incumbent defeat process. The Challenger Index is consistently larger when incumbent defeat occurs and/or the rate of incumbent retirement increases.

An observation from that research was that when all incumbents retired, it acted as a defeat for the incumbent school board. How was it interpreted when only a few retired due to various personal or medical reasons? How did this number affect the defeat process? The thinking was that it had some degree of association with incumbent defeat, thus the need to include a retirement adjustment factor in the response variable. The retirement adjustment factor represents the expected number of retired incumbents who would be elected if they had decided to run given they had as equal a chance of being elected as all of the challengers. Figure 2 describes the retirement adjustment factor and the response variable index calculations.

Figure 2

The Response Variable Index Calculation

$$R_1 = \frac{\text{Incumbents Winning + Retirement Adjustment}}{\text{Number of Positions}}$$

$$\text{Retirement Adjustment} = \frac{\text{Number of incumbents not seeking reelection}}{1 \text{ (Number of incumbents not seeking reelection + number of challengers)}}$$

In operationalizing the response variable index, note its interpretability against a 0-1 dichotomous dependent variable:

$R_1 = 1$ (victory) = Challengers $\leq$ the number of positions and the number of incumbents = the number of incumbent winners. Provided that nobody retires and the number of incumbents = the number of positions.

$R_2 = 0$ (defeat) = Otherwise. Provided that nobody retires and all incumbents lose.

The following calculations show how the response variable index, accounting for the number of challengers and the rate of incumbent retirement, effects the incumbent defeat process.

1. Consider when a school district has the following election dimensions:

   Positions = 3
   Number of retired incumbents = 2
   Number of winning incumbents = 1
   Number of incumbents running = 1
   Number of challengers = 3

   The R_1 index calculation would be .4667 instead of an R_1 of 1.

2. Consider when a school district has the following election dimensions:

Positions = 3
Number of retired incumbents = 2
Number of winning incumbents = 1
Number of incumbents running = 1
Number of challengers = 6

The R_1 index calculations would be .4166 against an R_1 of 0.

Treatment of the Data[1]

Following the collection of data, multiple regression analysis[2] was employed in order to build the "best fit" model accounting for the 1975 elections. Then, based on these models we attempted to predict the 1977 elections in the sample districts. In the cross-validation process the predictive ability of the 1975 models was statistically tested against the 1977 election outcome for districts in sub-classifications of upward, moderate and downward community trends. The assessment of the statistical predictions was conducted through both descriptive and inferential statistics. Residual and scatter plot analysis fell under the former, correlation analysis the latter. These statistics were used to draw conclusions about the models' ability to generalize to a population parameter.

Results

Hypothesis one posited that variables from the same set of social, economic and political data could again account for the occurrence of incumbent defeat elections in samples of Ohio school districts in 1975. In order to

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[1]It is clear that space here will not permit a complete presentation and discussion of the complicated statistical procedures used in this study. The reader is referred to Hunt (1980; pp 84-180) for a detailed description and discussion of the statistical procedures used in this study.

[2]The stepwise regression technique, Maximum R_2 improvement was used in the generation of the predictor models. It is part of the STEPWISE regression procedure in the Statistical Analysis System (SAS) computer system.

produce reasonable and workable models the number of variables permitted in any model for any subset ranged from seven to ten depending on the number of observations (districts) in the subset. The 1975 predictor models were generated from 20 variables run against the response variable index (R^1) on three data subsets.

Models accounting for the 1975 election results were produced ranging in significance from the .05 to .001 levels. Therefore, hypothesis one was confirmed. It was possible in the Ohio 1975 school board elections to account for the variance in the dependent variable (Incumbent Defeat) through the use of the same variables previously found useful in California, New Mexico and Massachusetts.

Hypothesis two proposed that the models produced to account for incumbent defeat in the 1975 election would predict incumbent defeat in the 1977 elections.

In spite of various attempts, including combining the moderate and downward subsets and using the moderate model to predict the new subset, a method that suggested promise, it was impossible to predict the 1977 election outcome. Although the descriptive statistical assessment showed that the models were appropriate for the data, the inferential statistical assessment did not. As a result hypothesis two was not supported. Therefore, we were forced to conclude that given the present state of knowledge, the use of global models will not suffice to predict the election results in individual school districts.

Conclusions

We are faced with frustrating results. Again a group of the same set of social, economic and political variables were able to account for the past

event, incumbent defeat of local school board members. But our attempts to predict the future election was a total failure. The following offers some speculation about this failure, draws conclusions and makes recommendations for future research.

Conclusion #1: The theoretical model was again confirmed to the extent that these variables shown before to be consistently related to incumbent school board member defeat again explained the event. These variables have now been demonstrated as important and useful on both the east and west coasts and in the midwest, as well as over a wide range of time and specific political differences. This finding enables one to conclude that a relationship exists between indicators of community conditions and the composition of an incumbent school board and, therefore, substantiates the dissatisfaction theorists' belief that a school district is a successful democratic government.

Conclusion #2: These variables, however, are not presently useful in designing global models to predict election results. Why? Perhaps an analogy is useful in understanding this frustrating result and determining some future direction for research.

For decades the variables accounting for the weather have been known. One can, without fail, account for the fact that it rained or the sun shown for the Fourth of July parade. But meteorologists are notoriously poor at predicting what the weather will be like before the event. It seems that the following are related to success in the weather and may be useful in future attempts to predict school elections. The prediction will be better:

1. the closer the prediction is to the event. (i.e., 24 hour predictions are much better than 10 day predictions and six month predictions are useless). Therefore, last minute changes in political conditions should be considered in predicting school elections.

2. the more specifically local the prediction. (i.e., the weather for a single community - based on its specific set of conditions - is much better than to extrapolate to a community based on a prediction for a region or state). Therefore, a model should be developed for specific school district based on data generated from that district alone.

Finally, it is clear that predictions are best seen as "an 80% chance of rain" as opposed to "rain" or "no rain." Additionally, in many areas it is possible that it might rain on your picnic and not on mine (local showers). This is possible in spite of a generally sunny day. The more sophisticated method of subsetting data to account for socioeconomic trends and of specifying incumbent defeat developed in this study should provide a useful beginning in this regard.

General Conclusions

In the prediction of local school board elections the variables repeatedly identified will account for the event but the global models built on past performance in many districts will not predict elections over the wide range of time (usually two or more years) and in specific districts given the political differences among 15,000 local school boards.

Finally, it may prove comforting to some of us that some elections are presently not predictable given the present state of the art and that some of us are capable of producing findings counter to models we have spent a decade and a half of our lives building. Life is still exciting.

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